TROUGHTON, E.L. (1967). *Furred Animals of Australia.* (Angus and Robertson: Sydney).

WATTS, C.H.S. (1969). Distribution and habits of the rabbit bandicoot. Trans. Roy. Soc. S. Aust. 93 : 135-141.

WATTS, C.H.S. (1970). The bilby or "rabbit bandicoot" *(Macrotis lagotis)*. Roy. Zool. Soc. S. Aust. 92nd Annual Report 1969-70 : 25-26.

OBSERVATIONS ON THE POLLINATION BIOLOGY OF *NYMPHAEA GIGANTEA* W.J. HOOKER (NYMPHAEACEAE)

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On January 28 and 29, 1982, I was afforded a brief opportunity to observe a small population of *N. gigantea* growing in Lily Creek of Hidden Valley near Kununurra, Western Australia (lat. 15°46'S, long. 128°45'E). Although the pollination biology of *Nymphaea* has been the subject of recent studies (Meeuse and Schneider, 1980; Schneider and Chaney, 1981) no previous observations on the pollination biology of *N. gigantea* have been made except for those of Schmucker (1932 1933, 1935) which were conducted within a greenhouse. This species is singularly important since it is the only member of the subgenus *Anecphya*, a water lily group well-known to lack carpellary (and usually staminal) appendages (Conrad, 1905). This structural difference with other *Nymphaea* species is well illustrated in Aston (1973; fig. 52). Although the structure-function relationships of these appendages remain undetermined, it has been hypothesized that they play a role in the attraction and nutrition of beetle pollinators (Schneider, 1982) in nocturnal flowering *Nymphaea* species. In diurnal species, however, the carpellary appendages appear to be involved in increasing the size and/or depth of the central stigmatic pool, in which, on the first day of anthesis, pollinators lose their pollen loads and occasionally drown. A field study of the pollination biology of *N. gigantea* may thus further our understanding of the pollination syndromes and the adaptive radiation of the genus.

Flowers of this species undergo at least four consecutive days of blooming. Flowers are fully open by 9.30 a.m. and close by (ca.) 5.00 p.m. First-day flowers are about 20 cm above the water, inodorous and characterized by their dark purple-violet corolla which, together with the calyx, is positioned to form a funnel-shaped perianth. The stamens are nearly vertical or sloped inward, with the anthers nodding, apparently not well supported by the narrow filaments. At the bottom of the "funnel" is the cup-shaped gynoecium, filled with a stigmatic secretion (ca. 5 ml). Twice, I was fortunate to observe *Trigona* bees, each with a considerable amount of pollen in its corbiculae (pollen baskets), visit fluid-filled, first-day flowers. In one case a *Trigona*, while attempting to land on the innermost stamens, accidently landed in the stigmatic fluid. Once wetted most of the pollen was "washed" from the bee and precipitated to the stigmatic surface. In the other instance, another *Trigona* sp. attempted to land on an anther. The narrow filament of the stamen bent downward dropping the insect to a lower anther where this process was repeated. Ultimately, the small bee "slipped" into the stigmatic fluid with the same result as mentioned above (i.e. cross-pollination).

During the second and succeeding days of anthesis, flowers become further elevated to about 30 cm above the water surface and the corolla fades to a light purple-violet. These older flowers are functionally staminate, with the numerous anthers dehiscing large quantities of pollen. The stigmatic surface is dry (non-receptive) and covered by the innermost stamens.

In addition to the *Trigona* bees, several Galerucinae beetles (Chrysomelidae) and a single individual of both *Leioproctus (Anacolletes)* sp. (Apidae) and an ephydrid fly were observed actively foraging for pollen. Although the former two insects were observed visiting a first-day (pollen-receptive) flower, I did not witness either of the organisms to come in contact with the potentially dangerous stigmatic pool in the manner described for the *Trigona* bees.

This field study supports Schmucker's concept, deduced from greenhouse observations, of the pollination mechanism in *N. gigantea*. Overall the mechanism is similar to that described in other diurnal species of *Nymphaea*, in which solitary bees are the principal pollinators. These bees and other pollinators either land directly in the fluid or the anatomy-morphology of the flower is so constructed as to create a sliding or dropping effect into the